

REMARKS

Claims 1-10 and 34-52 are pending. Claims 1, 4, 38, 41 and 50 are amended herein. Claim 52 is new. Applicant respectfully requests reconsideration of all claims in view of the following.

I. Response to Rejections Under 35 USC § 112

Claims 38-39 and 50-51 were rejected under 35 USC § 112, first paragraph, as non-enabled, because no embodiments disclose both a baffle and a redirection tube. In response, Applicant has amended Claims 38 and 50 to more accurately reflect the embodiment shown in Figure 7, in the larger context of Figure 1. Claim 38 has been amended to depend from Claim 2, and Claim 50 has been amended to depend from Claim 42. Claims 38 and 50 now each recite a fluidization apparatus having a redirection tube directing fluidized metal particles from the fluidization jet into the fluidization tube. Thus, through this dependency, the baffle limitation has been removed from each of Claims 38, 39, 50 and 51. Accordingly, Applicant requests withdrawal of the § 112 rejections.

II. Response to Rejections Under 35 USC § 102

A. Claims 1-10 and 40-46

Claims 1-10 and 40-46 were rejected under 35 USC § 102(e) as being anticipated by U.S. Patent No. 6,764,588 (“Smedley”). In response, Applicant files herewith: (i) Declaration of Stuart I. Smedley Under 37 CFR § 1.132; and (ii) Declaration of Kent I. Smedley Under 37 CFR § 1.132; both as evidence that the invention disclosed but not claimed in Smedley, Figures 5 and 6, was in fact derived from the inventors of subject matter claimed in Claims 1-10 and 40-46 of the present application. Accordingly, Applicant submits that Smedley is not prior art under 35 USC § 102(e), and therefore requests withdrawal of all rejections based thereon.

B. Claims 1, 2, 10 and 41-42

Claims 1, 2, 10 and 41-42 were rejected under 35 USC § 102(e) as being anticipated by U.S. Patent Application Publication No. 2002/0045075 (“Pinto”). In response, Applicant files herewith the Declaration of Stuart I. Smedley Under 37 CFR § 1.132 as evidence that the invention disclosed but not claimed in Pinto, Figure 1, was in fact derived from the inventor of subject matter claimed in Claims 1, 2, 10 and 41-42 of the present application. Accordingly, Applicant submits that Pinto is not prior art under 35 USC § 102(e), and therefore requests withdrawal of all rejections based thereon.

III. Response to Rejections Under 35 USC § 103

A. Claims 34-27 and 47-49

Claims 34-37 and 47-49 were rejected under 35 USC § 103(a) as obvious over Smedley. In view of the foregoing evidence disqualifying Smedley as prior art, Applicant further requests withdrawal of the obviousness rejections based on Smedley.

B. Claims 1-3, 10 and 40-43

Claims 1-3, 10 and 40-43 were rejected under 35 USC § 103(a) as obvious over U.S. Patent No. 6,162,555 (“Gutierrez”). Gutierrez is cited for teachings relative to a particle feeding apparatus in an electrochemical power system. According to the rejection, it would be obvious to add second pump to the power system for fuel delivery.

Well-established patent law holds that a rejection based on 35 USC § 103 cannot be sustained unless the cited reference(s) (a) provide a suggestion or motivation to combine reference teachings; (b) provide a reasonable expectation of success; and (c) teach all of the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Applicant traverses the § 103 rejections on grounds that adding a second pump to Gutierrez fails to teach all limitations of Claim 1 (as amended) and fails to provide a reasonable expectation of success.

To distinguish the present invention over Gutierrez, Applicant has amended Claim 1 to recite the following elements:

a fuel delivery pump controlling total flow rate of the metal particles and the electrolyte into the electrochemical cell stack; and
a fluidization pump varying the mass flow rate of the metal particles into the electrochemical cell stack independently of the total flow rate controlled by the fuel delivery pump

This amendment is fully supported in the specification, e.g. at p.5, ln. 10-14; p.9, ln. 15-19. The novelty captured in this amendment is best described by comparing FIG. 1 of the application to FIG. 1 of Gutierrez.

In FIG. 1 of the application, fluidization pump 106 circulates electrolyte through fluidization apparatus 105 in a circulation loop that returns electrolyte directly from fluidization apparatus 105 to fluidization pump 106 through fluidization input line 122. This arrangement allows fluidization pump 106 to vary the amount of metal particles being fluidized by adjusting the output of pump 106 without affecting the total flow rate (particles + electrolyte) controlled by the fuel delivery pump. In other words, mass flow rate of metal particles may be controlled independently of the total flow rate determined by the fuel delivery pump, as claimed.

However, in Gutierrez, this independent control is not possible, even if an additional pump is added to the system of Gutierrez immediately upstream of cell stack 16, as suggested in part 9 of the Office Action. As shown in FIG. 1 of Gutierrez, flow control into the cell stack 12 is already controlled by pump 26. *See Gutierrez, col. 8 lines 47-53 (“pump 26 provides the driving force at the beginning of the refueling to fluidize the fluidized bed 20 and move electrolyte and fuel particles 30 from the fluidized bed 20 into the fuel particle feed mechanism 12”).* To place an additional pump in series with pump 26 would not allow fluidization to be

controlled independently from cell stack flow, because the output of pump 26 would still affect cell stack flow.

For example, in Gutierrez, to achieve greater fluidization, the output of pump 26 may be increased. However, there is no return line for electrolyte from tank 20 to pump 26. Therefore, as electrolyte is pumped into tank 20 at a higher rate, the pressure at the outlet of tank 20 increases, which increases the flow to cell stack 16. This flow increase will occur regardless of an additional fuel delivery pump placed in series with the cell stack.

In the present invention, the aforementioned independent control is achieved, in part, by providing a return line for electrolyte connected directly between the fluidization apparatus and the fluidization pump. This return line is fluidization input line 122. *See Application, p.8, ln. 29-31 and FIG. 1*, which fully supports the following amendment to Claim 41:

*a fluidization input line connected to the electrolyte solution outlet and to
the fluidization pump inlet to complete the circulation loop*

This limitation distinguishes Claim 41 from Gutierrez.

In sum, Applicant submits that Claim 1, as amended, is non-obvious in view of Gutierrez because adding an additional pump to Gutierrez would not meet the limitations of Claim 1. Moreover, the additional pump would not achieve the limitations with any reasonable expectation of success. Applicant further submits that Claim 41, as amended, is non-obvious in view of Gutierrez because Gutierrez neither teaches nor suggests the return line (fluidization input line) limitation. Accordingly, Applicant requests that the obviousness rejections of Claims 1 and 41 based on Gutierrez be withdrawn. Claims 2, 3, 10, 40 and 42-43 should be allowed through dependency.

IV. Response to Double Patenting Rejection

Claims 1-10, 34-37 and 40-49 were rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 7-13 of Smedley.

Concurrently with this Response, Applicant submits a Terminal Disclaimer in accordance with 37 CFR 1.321(c) to disclaim that portion of any patent granted on the present application that would exceed the term of Smedley. Accordingly, Applicant requests withdrawal of the double patenting rejections.

V. Other Amendments

Claim 4 has been rewritten in independent form to include all limitations of Claim 1, as previously presented.

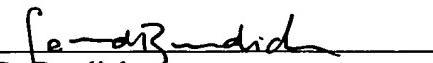
Claim 52 is new, and claims the same limitations that were added herein to Claim 1. Support for Claim 52 is provided in the specification, e.g. at p.5, ln. 10-14; p.9, ln. 15-19.

VI. Conclusion

In view of all of the above, Applicant requests issuance of all claims. In papers filed concurrently with this Response, Applicant has authorized payment of the appropriate fee for filing a Terminal Disclaimer. Applicant believes no other fees are due for filing this response. If any additional fee is in fact due, please charge the same to deposit account no. 19-2814, with reference to Snell & Wilmer docket no. 50534-0400.

Respectfully submitted,

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